we have the history of the genus, written in a manner that, except for the anatomical student, will not for very long indeed be surpassed.

Hints on cultivation and on species not yet introduced to cultivation, and remarks on saffron, its cultivation and uses, form Chapters V. and VI. Saffron would appear to have been cultivated in England prior to 1582, and from its importance as an article of commerce gave its name to Saffron Walden. It is very strange that after having been grown as an economic plant in England for three or four centuries its production has died out, and that it is an extremely difficult thing to get the saffron crocus to flower in this country. The author says that saffron was used as a royal dye in the olden time in Ireland, but this is a very doubtful statement.

Into the descriptive portion of this work it is needless that we should enter in detail. All the species and their chief varieties are most carefully described, full synonymic lists are given, and ample details as to the geographical distribution of each and its period of flowering. The description of each species is accompanied by a plate illustrating the corm, flower, leaves, fruit, and structural details; and, as if to add to the attractiveness of this splendid volume, there is a series of very exquisite woodcuts, introduced as head-pieces, of some of the more remarkable districts where the rarer species are found. Some of these are from original sketches, by Mr. Danford, of the remote mountain region of the Taurus and of other parts of Asia Minor, where, with Mrs. Danford, journeys were made in quest of crocuses. The volume is dedicated to Mr. and Mrs. Danford.

The appendix, by Mr. Lacaita, on the etymology of the words crocus and saffron, is of great interest, and tells of the almost world-wide use of the terms.

NOTES

LAST week, Sir William Armstrong paid to the bankers of the Royal Society a cheque for 7800*l.* for the Scientific Relief Fund.

THE Council of the Geological Society have awarded the medals to be given at the anniversary meeting of the Society on February 18, as follows:—The Wollaston Gold Medal to Mr. J. W. Hulke, F.R.S., the Murchison Medal to the Rev. P. B. Brodie, the Lyell Medal to Mr. S. Allport, and the Bigsby Gold Medal to Prof. C. Lapworth. The balances of the Funds at the disposal of the Society are awarded as follows:—The Wollaston Fund to Mr. B. N. Peach, the Murchison Fund to Mr. R. Kidston, and the Lyell Fund to the Rev. Osmond Fisher. We believe that the President's address at the anniversary meeting will deal mainly with the relations between geology and the mineralogical sciences.

THE Geographical Society of Australasia has been authorised by the Queen to prefix the word "Royal" to its title.

THE recent death of General Hazen, the chief of the Army Signal Service in the United States, which is responsible for the meteorology of that country, has raised the question whether or not meteorology should be dealt with by a civil rather than a military bureau. It will be remembered that when the present meteorological system was established in the United States it was connected with the Signal Service, in order to utilise the time of the officers and men during peace. There is no doubt that the work done by the American Signal Service has been done with a thoroughness and vigour which have not been equalled elsewhere; and the eminent men of science who have been associated with the Chief Signal Officer have taken care that the mere forwarding of weather information should not be the whole of their duties. A Committee of the National Academy of Science has already been appointed to consider the matter, and has recommended separation of the work from the War Office. Whatever decision is arrived at, it is to be hoped that the service in its new form (if it is to have one) may not be less efficient than it has been in the past. This question is of course part of the general question now being seriously discussed in the United States, as to whether a purely scientific service should be controlled and directed by scientific men. In the abstract there can be of course but one answer to this question, but it must at the same time be pointed out that to make a man of science responsible for large administrative and executive work is to destroy him utterly as a man of science. This is a good reason for having some one other than a man of science for the carrying out of such work. It is, however, no argument for placing the man of science in a subordinate position to any mere administrator, and it would perhaps be best to intrust such inquiries on a very large scale to a small Committee, one of whom should be the man responsible for the science and the other the man responsible for the administration.

VERY enlightened ideas prevail among the influential classes of India with regard to the manner in which the Queen's Jubilee should be celebrated. On the motion of Dr. Hunter, the Vice-Chancellor of Calcutta University, the Jubilee Committee at Calcutta decided some days ago that the fund which is to be raised in India for a permanent memorial, shall be devoted partly to the Imperial Institute in London, partly to a scheme for the placing of technical education in India on a sound and lasting basis. It is said that the provincial cities are resolved not to be outstripped by the capital. The people of Patna propose to found an industrial school, and the Calcutta Correspondent of the *Times* says their example is likely to be followed in many places. The native princes have also begun to see the importance of technical education, and the Maharajah of Mysore has determined not only to contribute largely to the Imperial Institute in London, but to form an Institute of a similar kind in his own dominions. All this promises well for the material progress of our great dependency, and it should tend to strengthen the movement among ourselves for the establishment of closer relations between science and industry.

NEARLY four years ago we were able to announce that a vote had been passed at Oxford authorising the Curators of the University Chest to spend a sum of 7500*l.* in building an annex to the east side of the University Museum, to contain the splendid anthropological collection which General Pitt-Rivers had most munificently offered to the University, and in providing the requisite cases and fittings. The collection has now been partially arranged in the hall built for it, and is thrown open to visitors. It has been enriched by objects transferred from other University Museums, such as the Ashmolean, and by numerous donations from other sources. The opening of the collection ought to mark an epoch in the history of anthropological study at Oxford. Its importance arises less from the value of the objects (although that, of course, is very great) than from the manner in which they are grouped. The arrangement brings out with astonishing clearness the working of the law of evolution in the development of all kinds of implements and weapons.

IT is proposed that a Medical School shall be formed in connection with University College, Dundee. There can be little doubt that the scheme will be successful, for not only has Dundee an important hospital, but medical students at the new school would have the advantage of being able to take the degrees of the University of St. Andrews. Some time ago Mr. T. H. Cox offered 12,000*l.* as an endowment for a Chair of Anatomy, and now the sons and daughters of the late Mr. J. F. White, of Balruddery, have given 6000*l.* to found a Lectureship or Chair to be associated with their father's name.

About 2000 delegates, including about 300 from Europe, are expected to be present at the ninth triennial meeting of the International Medical Congress at Washington in September next. An effort is being made to secure the hall of the House of Representatives for the opening meeting. After this meeting the Congress will be divided into seventeen sections, assembling in the different halls of the city.

Mr. G. T. Ryves, F.R.Met.Soc., wrote the other day to the *Times*, from Stoke-on-Trent, presenting the results of an independent comparison of the daily forecast issued by the Meteorological Office for the Midland District with the actual weather experienced in 1886. The number of forecasts sent out by the Office during the year was 310. Of these, 309 were tested, and Mr. Ryves found that there were 247 absolute successes, 26 absolute failures, and 36 partial or doubtful successes. That is to say, omitting small fractions, there were 80 per cent. of successes, 8½ per cent. of failures, and 11½ per cent. of doubtful cases. Mr. Ryves understands that a similar result has been arrived at in other places where the forecasts have been submitted to an examination extending over a period of sufficient length to make it possible to strike a fair average.

The French Minister for Public Instruction has nominated a Commission, under the presidency of M. Bertrand, the Secretary of the Académie des Sciences, which will award a prize of 50,000 francs (2000*l.*) to the inventor of a cheap method for the application of electricity to the purposes either of heating and lighting, chemical or mechanical force, telegraphy, or the treatment of the sick.

The Royal Scientific Society of Göttingen offers a prize of 500 marks (25*l.*), in 1889, for a complete review of the literature of the Arabs and the Arabian-speaking tribes of the Islam and Christian kingdoms up to the time of the conquest of Egypt by Turkey. Further particulars can be obtained of the Society.

Mr. Maclean, the official assistant to the Professor of Natural Philosophy in the University of Glasgow, has just published a little book containing examples of exercises given in the natural philosophy class during recent years, with indications how to answer them The exercises deal largely with dynamics and properties of matter, and include sound, light, magnetism, electricity, and heat. The exercises, especially those on dynamics, are very interesting, and indicate distinctly the thoroughness of the instruction given. Several of the hints for solution will be found also of great value to students.

We have frequently had to refer to the scientific *renaissance* now going on in Italy. Another indication of this has just reached us, in the shape of a volume of some 500 pages, on "Geological Evolution : Inorganic, Animal, and Human," by Signor Enrico del Pozzo di Mombello. The book is published by Sgariglia, of Foligno. It exhibits a wide philosophical grasp of the subject. The first chapter is almost confined to an analysis of Herbert Spencer's "Principles of Evolution." The writer then discusses the nebular hypothesis, and the new views as to the inorganic evolution now going on in the sun. Geological climates, with full references to the works of Lyell and Croll, follow ; and after a chapter on vulcanism are chapters on practical geology. The rest of the work deals with life, including a full statement of Darwinism and human evolution, while the last chapters are devoted to prehistoric man. Such a book as this will be of the greatest service to science in Italy.

We have received the fifth edition of "Celestial Motions," a handy book of astronomy, by Mr. W. T. Lynn, formerly of the Royal Observatory, Greenwich In this last edition a chapter has been added on the refraction, propagation, and aberration of light. The treatment, however, is necessarily so limited, that the chapter is practically useless for educational purposes.

We have received also the fifth edition of Prof. Bentley's "Manual of Botany." The physiological part of the subject has been largely revised, with the assistance of Mr. J. D. Groves, Demonstrator of Practical Biology at King's College, London. Many alterations have been made in the part treating of the properties and uses of plants ; but the most marked change is in those chapters relating to the classification of plants. The book is now adapted in all essentials to the arrangement adopted in the "Genera Plantarum."

A strong shock of earthquake was felt in Venice on the night of January 24. No damage seems to have been done. At Aquila, in Lower Italy, seven shocks of earthquake were noticed on January 26, three of which were rather strong. They occurred between 2.30 p.m. and 7.45 a.m. of the next day.

On the night of January 31 a shock of earthquake was felt in Zurich and the neighbourhood, and in the cantons of Zug and Schwyz. The district affected was about 80 kilometres in diameter.

Under the auspices of the Geological and Natural History Survey of Canada, Prof. J. Macoun, of Ottawa, has now completed the first volume of his "Catalogue of Canadian Plants." The third part, just published, comprises the Apetalæ, Coniferæ, and a long list of additions and corrections to parts 1 and 2, carrying the work down to the end of Exogens.

A consignment of German carp has been forwarded to Portugal by the National Fish-Culture Association, for the purpose of acclimatisation in the waters of that country. The experiment is being made by Messrs. Broughton and Frietas, who have also made arrangements to import a quantity of salmon and trout ova, and hatch them out for a similar purpose. The National Fish-Culture Association have intimated their intention of supplying Salmonidæ fry this year gratuitously to public bodies desirous of repopulating depleted waters. One million and a half of whitefish ova (*Coregonus albus*) arrived from the American Government at the hatchery of the Association on January 31.

The National Fish-Culture Association have just issued the first number of their quarterly Journal, edited by Mr. J. W. Willis-Bund. The objects of this publication are not only to chronicle the operations of the Association, but to collect information concerning the fish, fish-culture, and fisheries both of the United Kingdom and abroad. The present number includes articles by Dr. Francis Day, Mr. J. W. Willis-Bund, Mr. W. Oldham Chambers, and Mr. Anderson Smith.

Herr Richard Andree, of Leipzig, who has for some years past made a special study of cannibalism and its prevalence in ancient and modern times, has recently published (Beit : Leipzig) a pamphlet on the subject, which is full of interest to others besides the ethnologists for whom it is, of course, mainly intended. He treats first of the practice of anthropophagy in prehistoric times, discussing traces of it in popular tales, legends, and superstitions. To this section also belong the investigations into the remains found in caves and ancient burial-places in Europe, which Herr Andree thinks prove beyond doubt that cannibalism existed at this remote epoch in countries which are now the most highly civilised on the globe. The next part deals with the geographical distribution of the practice at the present day. The mass of information brought together is drawn from the literature of many countries, ancient and modern, and is enormous in amount. The writer attributes the origin of cannibalism to hunger and want in the first instance, until it developed into a settled practice, from which the step to human sacrifice, whether of single individuals, such as prisoners, or of holocausts of victims, as in ancient Mexico, is not a long one.

The death is announced of Dr. Philip Fischer, the well-known mathematician and Professor at the Polytechnic Institution at Darmstadt. He died on January 22.

In a recent issue, *Science* comments on the fact that the number of lectures delivered by professors at Oxford and Cambridge falls considerably below that which it is usual for a professor to give in the United States. *Science* is by no means of opinion that the American plan is best. American professors are, it says, compelled to teach and lecture so much that few of them have an opportunity of doing justice to their abilities as investigators and writers. Our American contemporary counsels governing Boards in the United States to take this fact into serious consideration. "They value a professor according to the number of lectures he delivers and the number of students he attracts. They fail to perceive that scientific research is the peculiar duty, and should be the peculiar privilege, of the University professor. Oxford and Cambridge professors do more original work than our professors, simply because they are given the time for it."

Capt. Dutton, of the U.S. Geological Survey, is making rapid progress with the preparations for his Report on the Charleston earthquake. With regard to the velocity of the propagation of the earth-wave, the final computations have not yet been made, but the evidence is said to indicate with certainty a velocity somewhat in excess of three miles per second.

We have received the new number of the *Annuaire* of the Royal Observatory of Brussels, by M. Folie, Director of the Observatory. This periodical has appeared every year without interruption since 1834. The present number, like its predecessors, contains much useful astronomical information. The section on physical units and constants has been enlarged, and there are valuable notes on the geography and statistics of Belgium.

Messrs. Rivington will shortly have ready a "Text-book on Animal Biology," by Prof. C. Lloyd Morgan, of University College, Bristol. The first part of the volume deals with the anatomy and physiology of vertebrates, as exemplified by the frog, the pigeon and fowl, and the rabbit. In this part there are special chapters on histology, embryology, the genesis of tissues and organs, and animal metabolism. The second part is occupied with the structure and life-history of some invertebrate types, viz. the crayfish, cockroach, earthworm, liver-fluke and tapeworm, snail, freshwater mussel, hydra, vorticella, and amœba. Numerous outline woodcuts have been drawn specially for this work. It aims at satisfying the requirements of those who are preparing for the immediate science and preliminary scientific examinations of the London University, and for the Oxford and Cambridge Local Examinations.

In a report on the working of his department during the past six years, which has just been laid before Parliament (C—4943), the Controller of the Stationery Office refers to the publication of the Report of the scientific results of the exploring voyage of the *Challenger*. This was much delayed, Mr. Pigott observes, by the long illness and death of Sir Wyville Thomson in 1882, but it now approaches completion. The original estimate of the bulk of the work has already been very largely exceeded, "owing," writes Mr. Murray, the present editor, "to the enormous wealth of the observations and collections made during the expedition not having been at first realised." Twenty-seven quarto volumes, illustrated by about 2000 full-sized lithographic plates (many of them exquisitely finished in colours), by some eighty charts and diagrams, and by many hundred photographs and woodcuts, either already have been, or in the course of a few weeks will be, published. The editor (continues Mr. Pigott) estimates that another seven volumes at least will be required to complete the work, but hopes that with perhaps the exception of the last, in which it is intended to show the bearing of facts stated in the previous volumes on theories hitherto accepted, all will be before the public before the end of the coming financial year (March 31, 1888). The Controller thinks that perhaps it is fortunate for science that the Lords of the Treasury, when considering whether the publication of the results of the voyage should be undertaken at the public expense, were necessarily imperfectly informed of the cost. The amount paid from Stationery Office votes alone has already reached nearly 25,000*l.*, of which about 12,000*l.* only has been recovered by sales. To the balance of this account in calculating the actual cost of the book must be added the sums granted annually by Parliament for the expenses of the commission since the return of the ship—something over 40,000*l.*, making the net cost of the publication up to the present time, roughly, 53,000*l.*—a larger sum perhaps than has ever been spent by any Government on a single work. On the other side, however, Mr. Controller Pigott is good enough to add that the value of the Report can scarcely be exaggerated, and in a few lines he gives his estimate of the work of the expedition.

Lieutenant W. H. Emory, of the U.S. Navy, who commanded the *Bear* in the Greely Relief Expedition, has been ordered to the *Thetis*, and will shortly sail for Alaska. He is to investigate the seal-fisheries, and has received special instructions regarding the boundary-line between Alaska and British territory.

There seems to be some need for a scientific examination of medals granted in America for distinguished services. The "fine, large, gold medal," given to General Grant for the part he played in the Mexican war, is now in the National Museum, Washington, and, according to *Science*, it is "bogus," having a specific gravity of only 7 instead of 16.

In a recent Report, Mr. J. R. Dodge, Statistician of the U.S. Agricultural Department, shows that the amount of beetroot-sugar produced last season exceeded the cane-sugar by 162,000 metric tons. The manufacture of beet-sugar is wholly a European industry, and Mr. Dodge says its success in Europe is largely due to the fact that each shareholder in the stock of a beet-sugar factory is required to furnish so many beets per share. The farmers are in reality the manufacturers, and, since they obtain the profits of the manufacture, it is their interest to raise good beets at a nominal price. Mr. Dodge states that the sugar consumed in the United States amounts to about one-fourth of all the sugar reported from the places of principal production, and that within twenty-five years the country will require as much as the whole of the present supply of the cane-sugar of commerce, and nearly as much as the present production of beet-sugar. Mr. Dodge expresses surprise that Americans "scour the world for food-products costing more than 200,000,000 dollars per annum, the larger portion of which should be produced in the United States." What is needed, he thinks, is "a more skilful, scientific, and inventive agriculture."

The introduction of the electric light is not always, apparently, an unmixed benefit. Some time ago electric lights were placed in front of the Treasury and other public buildings in Washington, and a fine and striking effect is said to have been produced. Unfortunately, however, spiders discovered that game is plentiful in the vicinity of the new lights, and that they may there ply their craft successfully both day and night. In consequence, as Mr. G. Thompson writes to *Science*, their webs are so thick and numerous that portions of the architectural ornamentation are no longer visible, and when the webs are torn down by the wind, or fall from decay, the refuse gives a dingy and dirty appearance to everything it comes in contact with.

WE notice in one of the morning papers that considerable progress is being made at the great Lambeth factory of Messrs. Maudslay, Sons, and Field, with the large compound engines which are being prepared for the new Italian armour-clad *Il Re Umberto*. According to the contract, these engines are to be of 19,500 horse-power, which is about 7500 horse-power more than that of any vessel yet designed for the British Navy. It is stated that they will actually indicate 21,000 horse-power, or 9000 more than any vessel in the British Navy. These engines, completely made of steel, are expected to drive the *Il Re Umberto*, fully equipped, about 20 knots per hour.

MR. C. C. LACAITA is taking charge of the Sanitary Registration of Buildings Bill in the House of Commons. The Bill as introduced in 1886 consisted of ten sections, and, it will be remembered, made the sanitary registration of all buildings compulsory in towns of 50,000 inhabitants and upwards. The new Bill consists of seventeen sections, and is to apply to all towns or districts of 2000 inhabitants, but it is only to be compulsory in the case of schools, colleges, hospitals, asylums, hotels, and lodging-houses. An important feature of the new Bill is that the local authorities will have to keep a Sanitary Register, in which any building certified in accordance with the proposed Act may be registered, so that a stranger visiting any district would be able to ascertain at the office of the local authority whether any particular house was or was not certified as in a satisfactory sanitary condition. The new Bill will, no doubt, be more acceptable to sanitary experts, seeing that all persons entitled to certify must first obtain a license from the Local Government Board, and provision is made for the appointment of examining Boards. Persons entitled to sign certificates are designated Licentiates in Sanitary Practice.

THE town of Baku was recently threatened with destruction by the sudden outburst of a natural naphtha fountain. This was soon followed by a volcanic eruption from Lok Botan, close to the Ponta railway station, and about ten miles from Baku. The eruption began on the night of January 15, when the inhabitants of Baku were alarmed by a shock like that of an explosion, which made all their window-panes tremble violently, while towards the south-west the sky was illuminated by an intense light, as of some terrific conflagration. The following information, furnished by the railway officials of the Ponta station, appeared in a telegram from the St. Petersburg Correspondent of the *Times* on Monday last :—"Quite suddenly, at eleven o'clock at night, the noise of an explosion was heard, and the summit of Lok Botan shot up an enormous column of fire some 350 feet high. The whole country was instantly lit up brighter than day, and the heat could be felt at nearly a mile from the crater. There was scarcely any wind, so that the column continued to ascend quite vertically, carrying with it, as could be seen, large dark substances which appeared to fall again into the volcano. This lasted with short intervals of subsidence all through the night and the following twenty-four hours, but luckily the matters ejected did not reach the railway station." The *Times* Correspondent says that the volume of muddy liquid thrown out is estimated at half a million cubic *sojenes*—the Russian *sojene* equalling 7 feet—and has spread itself over more than a square mile to a depth of from 7 to 14 feet.

ON the night of January 26 a brilliant meteor was observed at Holmestrand, on the south-east coast of Norway. It went from south-west to north-east, at a rapid pace, and disappeared below the horizon. The light was an intense white, illuminating for a few seconds the whole town as in broad daylight.

A STATUE is to be erected at Christiania in honour of the celebrated mathematician Abel, subscriptions being raised towards it from all parts of Europe.

THE Council of the Royal Meteorological Society have arranged to hold, at 25 Great George Street, S.W. (by permission of the Council of the Institution of Civil Engineers), on March 15 to 18 next, an Exhibition of Marine Meteorological Instruments and Apparatus. The Exhibition Committee are anxious to obtain as large a collection as possible of such instruments; and they will be glad to show any *new* meteorological instruments or apparatus invented or first constructed since last March, as well as photographs and drawings possessing meteorological interest.

MR. JOHN MURRAY, of the *Challenger* Expedition Office, Edinburgh, writes to us that the passage placed within inverted commas in one of our Notes on Jan. 27 was not a quotation from his address to the Royal Society of Edinburgh. We may explain that the passage was quoted from what professes to be "a condensed report of the address" in the January number of the *Scottish Geographical Magazine*. In this "condensed report" Mr. Murray is represented as having said that "money grants of considerable annual value are devoted to the maintenance of learned Societies in London and Dublin." Our only object was to point out that so far as London is concerned this statement is misleading.

THE additions to the Zoological Society's Gardens during the past week include a Black-winged Peafowl (*Pavo nigripennis* ♀) from Cochin China, presented by Mr. John Marshall; a Cayenne Lapwing (*Vanellus cayennensis*) from South America, purchased; six Long-fronted Gerbilles (*Gerbillus longifrons*), born in the Gardens.

OUR ASTRONOMICAL COLUMN

COMET BROOKS (1887 *b*).—This object was observed at Paris on January 27 as a circular nebulosity of about 1'·5 in diameter, with a small but fairly bright nucleus, almost stellar in appearance, and situated not quite in the centre of the coma. The comet was estimated as of the 12th magnitude.

Dr. Rud. Spitaler, Vienna Observatory, has computed the following elements and ephemeris :—

$$T = 1887 \text{ March } 23\cdot01985 \text{ Berlin M.T.}$$

$$\left.\begin{aligned} \pi &= 89^\circ\ 26'\ 17'' \\ \Omega &= 283\ \ \ 0\ \ 15 \\ \iota &= 102\ \ 25\ \ 29 \end{aligned}\right\} \text{Mean Eq. } 1887\cdot0$$

$$\log q = 0\cdot19021$$

Error of middle place ($O - C$).

$$d\lambda \cos\beta = +9'', \qquad d\beta = -5''.$$

Ephemeris for Berlin Midnight

1887	R.A. h. m. s.	Decl. ° ′	log Δ	log *r*	Brightness
Feb. 12	1 59 34	+ 73 5·6	0·07734	0·21040	1·39
16	2 35 23	68 19·5	0·08193	0·20660	1·39
20	2 59 23	63 27·4	0·09016	0·20314	1·36
24	3 16 58	58 41·5	0·10154	0·20007	1·31
28	3 30 42	+ 54 9·1	0·11553	0·19744	1·25

The brightness on January 25 is taken as unity.

COMET BARNARD (1887 *c*).—Barnard's comet was observed at Paris on January 26, and seemed to be of much the same brightness and dimensions as Brooks's comet appeared on the following night, but it differed somewhat as to its nucleus, there being a central condensation forming a diffused nucleus about 4" or 5" in diameter. The comet is steadily diminishing in brightness. The following elements and ephemeris are by Prof. E. Weiss :—

$$T = 1886 \text{ November } 23\cdot6302 \text{ Berlin M.T.}$$

$$\left.\begin{aligned} \pi &= 284^\circ\ 27'\ 58'' \\ \Omega &= 257\ \ 14\ \ 17 \\ \iota &= 85\ \ 22\ \ \ \ 5 \end{aligned}\right\} \text{Mean Eq. } 1887\cdot0.$$

$$\log q = 0\cdot15454$$

Error of middle places ($O - C$).

$$\Delta\lambda \cos\beta + 4'' - 3'', \qquad \Delta\beta - 1'' - 9'.$$